The effects of microplastic on freshwater Hydra attenuata morphology & feeding

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The effects of microplastic on freshwater *Hydra attenuata* feeding & morphology

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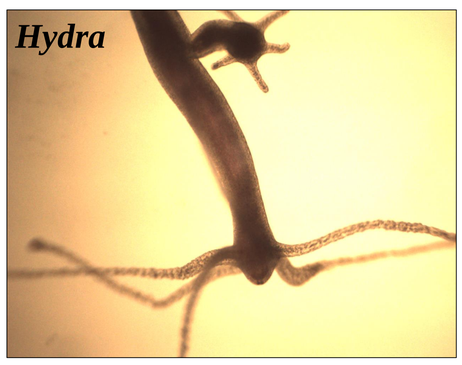
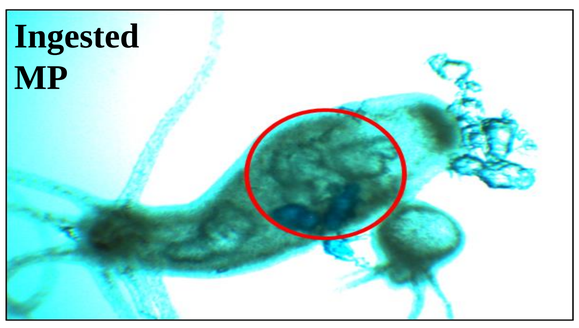
Introduction

The issue of microplastic (MP) pollution has been primarily focused on the marine environment with comparatively little attention given to freshwater (Eerkes-Medrano et al., 2015). *Hydra attenuata* is a freshwater cnidarian inhabiting slow moving permeant waterbodies and play an important role in regulating the planktonic structure of these habitats (Burnett, 1973). Hydra have been used widely in bioassays to test the toxicity of numerous environmental contaminants (Quinn et al., 2008). There are currently no standardised tests for assessing the impact of microplastics. Here we investigate the potential impact MP have on the feeding and morphology of *Hydra* towards the development of a standardised bioassay.

Materials & Methods

- 18 *Hydra* placed in 0.5 ml Eppendorf tubes
- Exposed to MP extracted from face wash
- Concentrations: Control, 0.01, 0.02, 0.04, 0.08 g/ml
- 10 *Artemia* were added to determine feeding rates
- Ingestion of MP was also recorded
- Morphology scored 10-1 (Wilby, 1988) after 3, 24, 48 & 96 hrs
- Score 8-6 reversible signs of intoxication
- 5-0 irreversible, leads to disintegration of the *Hydra*





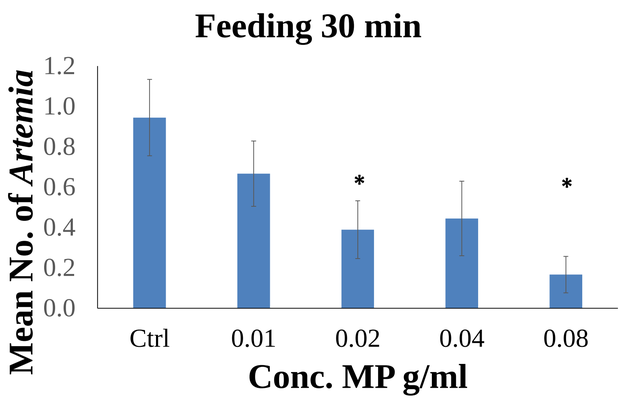
Results

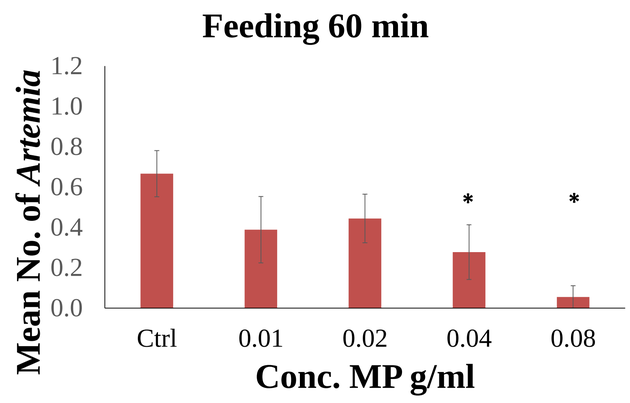
Feeding 30 min: Mean No. of *Artemia* ingested was significantly lower in 0.02 & 0.08 g/ml compared to the Ctrl.

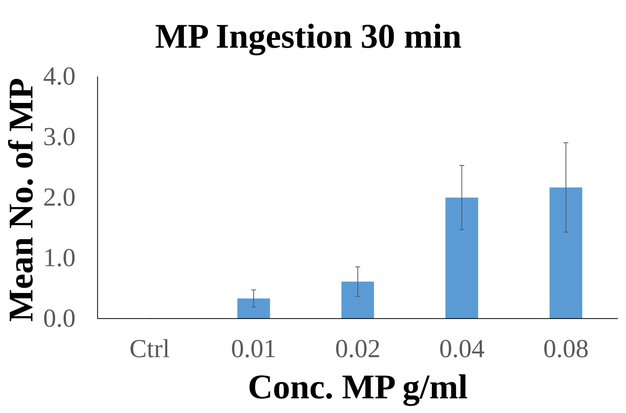
Feeding 60 min: Mean No. of *Artemia* ingested was significantly lower in 0.04 & 0.08 g/ml compared to the Ctrl.

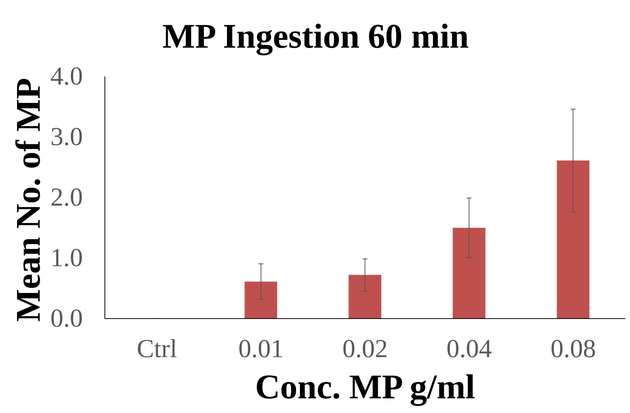
MP Ingestion: Increased as the conc. of MP increased, ranged from 0 to 10 pieces of MP. High ingestion rates also caused hydra to float.

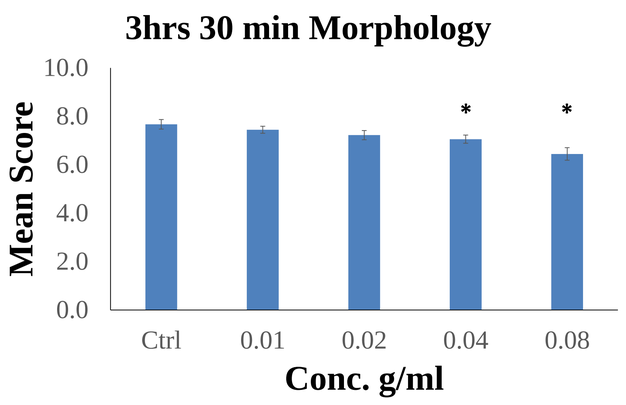
Morphology: Non lethal changes observed to the morphology after 3 hrs.

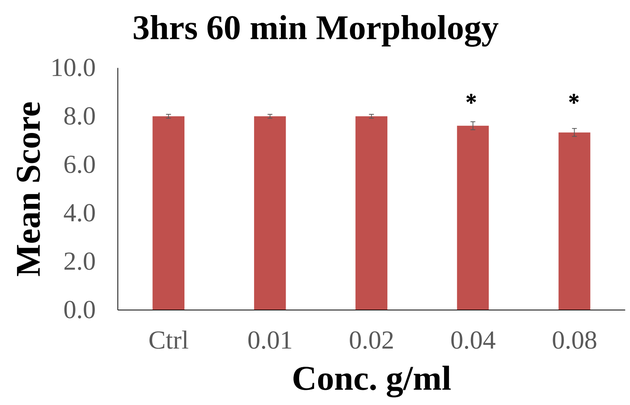












Conclusion

- MP are ingested by *Hydra attenuata*
- The presence of MP significantly reduces the feeding rate of *Hydra attenuata*
- Feeding is an ecologically relevant endpoint
- MP is ubiquitous in the environment
- What are the effects of other polymers and types (fibres, films….etc.)?

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